IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Inventor Name(s): KRAUS & BACHMAN

Title: LIGHT SOURCE

Mail Stop Appeal Brief
Commissioner for Patents
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APPEAL BRIEF

Sir:

I. REAL PARTY IN INTEREST

The real party in interest is Koninklijke Philips Electronics, N.V. ("KPENV"), a corporation of the Netherlands.

II. RELATED APPEALS AND INTERFERENCES

Applicant is not aware of any related appeals or interferences.

III. STATUS OF CLAIMS

Claims 8-10 stand rejected over US2002/0048344 ("Bachmannn") under 35 USC §102(b).

Claims 1-7 and 11-15 stand rejected under 37 USC 103(a) over US 6,052,401 ("Wieser")

in view of Bachman.

Claims 1-20 are on appeal.

IV. STATUS OF AMENDMENTS

There were remarks but no amendment under section 116. The remarks have nevertheless been indicated as "entered" by the Examiner.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Apparatus claims

Independent claim 1

This claim recites a light source (1). The light source includes a discharge vessel (2) and an electron beam source (4). The discharge vessel is filled with a filling gas. The electron beam source is arranged in vacuum or in a region of low pressure and (4) generates electrons (12) and propels them through an inlet foil (8) into the discharge vessel (2). The inlet foil (8) comprises a diamond layer. Claim 1 is illustrated in Fig. 1, which is described *e.g.* at p. 3, ll. 6-21 of the specification. In sum, then, Claim 1 relates to a gas discharge lamp that emits *light*.

Independent claim 11

This claim recites a gas discharge lamp (1). The lamp includes a discharge vessel (2). The discharge vessel is filled with a filling gas. The vessel is adapted to produce non-coherent visible light from at least one wall in response to received radiation produced by the gas. The lamp includes an inlet foil (8) that includes a diamond layer. The lamp also includes an electron

beam source (4) arranged in vacuum or in a region of low pressure. The source (4) generates electrons (12) and propels them through the inlet foil (8) into the discharge vessel (2), causing the gas to produce the radiation. This is illustrated in Figure 1 and described *e.g.* at p. 3, ll. 6-21 of the specification

METHOD CLAIMS

Independent claim 8

This claim recites a method of manufacturing a foil (8) for a light source (1). The method is characterized by depositing carbon atoms on a substrate (7) so as to form a diamond foil (8). The method is further characterized by etching away a portion of the substrate such that a remaining portion (7) of the substrate forms a frame (7) for the diamond foil (8). This is described in the specification, *e.g.* at p. 3, lines 28-30.

Independent claim 9

This claim recites a method of manufacturing a foil (8) for a light source (1). The method is characterized by depositing carbon atoms on a substrate so as to form a diamond foil (8), removing the diamond foil (8) from the substrate, and brazing the diamond foil (8) to a frame (7). This is described in the specification *e.g.* at p. 3, lines 30 et seq.

Independent claim 10

This claim recites a method of manufacturing a foil (8) for a light source (1). The method is characterized by depositing carbon atoms on a substrate so as to form a diamond foil (8),

removing the diamond foil (8) from the substrate (7), and adhering the diamond foil (8) to a frame (7). This is described in the specification *e.g.* at p. 3, lines 30 et seq.

Independent claim 12

This claim recites a method of manufacturing a light source. The method includes providing a discharge vessel and an electron beam source and inserting an inlet foil between the vessel and the electron beam source. The vessel is adapted to produce non-coherent visible light from at least one wall in response to received radiation produced by the gas. The electron beam source (4) is arranged in vacuum or in a region of low pressure. The source (4) generates electrons (12) and propels them into the discharge vessel (2), causing the gas to produce the radiation. The method includes inserting an inlet foil between the source and the vessel. The ;inlet foil comprises a diamond layer. The steps are not necessarily performed in any particular order. The method is described on pages 3 and 4 of the specification and a result of this method is disclosed in Fig. 1.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The rejection of claims 8-10 over Bachmann under 35 USC §102(b).

The rejection of claims 1-7 and 11-15 under 37 USC 103(a) over Wieser in view of Bachmann.

VII. THE ARGUMENT

THE REJECTION OF CLAIMS 8-10 OVER US2002/0048344 ("BACHMANNN") UNDER 35 USC §102(b)

Bachmann is not a reference under 35 USC 102(b). It was published on April 25, 2002. The present application claims priority of German application # 10210045.4, which was filed March 7, 2002. Section 102(b) only applies where a document was published more than a year before the filing date of the application. Bachman may be a reference under 35 USC 102(e).

Why can't a film be readily transported from an x-ray source (Bachman) to a light source/gas discharge lamp (invention)?

One of ordinary skill in the art would not normally look to the x-ray tube field, e.g. Bachmann, for technology to be used in the field of gas discharge lamps that produce "light." The term "light" is understood by those of ordinary skill in the art to mean electromagnetic radiation in the visible spectrum, rather than x-rays. Attached is an excerpt from a wikipedia article of record in this application showing the difference in spectral range between x-rays and visible light. This difference in spectral range results in tremendous differences in physical properties.

The x-ray situation is one of extremes

- heat, approximately 500 – 800 °C, which requires intermediate materials between the window and the frame. This intermediate layer is discussed

throughout the Bachman application, *see e.g.* paragraph 0005, line 6 et seq. and paragraphs 0017-0020;

- corrosion from the metal vapors of the liquid metal target;
- high energy electron source (140 KeV – as opposed to 40 KeV in the lamp); and
- pressure: at least 5 bars near the window, but design constraints up to 10 bars – in other words, the reference discloses a very high cost window.

High cost materials are tolerable in a professional context, such as the special intermediate layer discussed in the reference. By contrast, the gas discharge lamp, which is a light source, is to be sold in the consumer context. The high cost window necessary and tolerable in the professional context, would ***not*** be considered suitable by one of ordinary skill for a gas discharge light source that needs to be sold cheaply in a consumer context.

Second, in the Bachman reference, x-rays are generated near the window foil and only those x-rays can leave the system at a reasonable take-off angle for further use, while in the gas discharge lamp, the light is emitted from the discharge vessel – which the x-ray tube does not have.

Third, the window 3 in the reference is two way, with both the electrons and the x-rays going through per paragraph 0034. By way of contrast, in the gas discharge light, the light is emitted throughout the entire discharge tube and only the electrons go through the window.

Given all these differences, the only way one of ordinary skill in the art could arrive at the invention from Bachman would either be undue experimentation involving testing materials in an actual gas discharge lamp or impermissible hindsight in light of Applicants' disclosure – and

most likely both of these.

An article of record in this application about electromagnetic radiation and explaining some differences between x-rays and light appears in the appendix.

Claim 8

The Examiner states that the etched portion of the substrate forms a frame in Bachman. Applicants respectfully submit that the Examiner mischaracterizes the reference – at least so far as Applicants can discern based on the cited sections. Paragraph 30 (and also 5 and 17-20) clarify that the film is connected to a retaining element along with an intermediate layer. The film itself does not form a frame. The retaining element is the frame. The higher temperature/pressure conditions in the x-ray tube require the intermediate layer and supplementary frame, which are not needed in the gas discharge lamp. Applicants accordingly respectfully submit that the Examiner has failed to make a *prima facie* case against this claim.

Claim 9

The Examiner points to paragraph 29 of Bachman as showing the foil brazed to a frame. Applicants respectfully submit that the Examiner mischaracterizes the reference – at least so far as Applicants can discern based on the cited sections. The foil is glued or fused to an intermediate layer, which then in turn is connected to a retaining element. Again, the foil cannot be directly attached to the frame in Bachman, because the conditions are more extreme in the x-ray environment and the immediate layer is required for temperature buffering. Applicants accordingly respectfully submit that the Examiner has failed to make a *prima facie* case against

this claim.

Claim 10

Again, the Examiner points to paragraph 29 of Bachman as showing the foil adhered to a frame. Applicants respectfully submit that the Examiner mischaracterizes the reference – at least so far as Applicants can discern based on the cited sections. Applicants find the foil adhered to an intermediate material, which then is connected to the retaining element. The foil does not appear to be adhered to the frame. Applicants accordingly respectfully submit that the Examiner has failed to make a *prima facie* case against this claim.

THE REJECTION OF CLAIMS 1-7 AND 11-15 UNDER 37 USC 103(a) OVER WIESER IN VIEW OF BACHMANN

Bachmann is not a reference under 35 USC 102(b). It was published on April 25, 2002. The present application claims priority of German application # 10210045.4, which was filed March 7, 2002. Section 102(b) only applies where a document was published more than a year before the filing date of the application.

Bachmann is, at best, a reference under section 102 (e); however, in this case, it cannot be combined under section 103 (a), because it was owned by the same parent corporation as the present application. Bachmann shares a common inventor with the present application. All of the inventors in both applications were employed by Philips. The reference states on its face that it was assigned to US Philips Corporation; however that entity is or was a subsidiary of KPENV, which is also the assignee of the present application – and the Bachmann reference was later

transferred to KPENV as a matter of course due to internal administrative housekeeping. Accordingly the same "person" owned both.

Claims 11 & 12

The Examiner has ignored the "adapted to produce" language in these claims. Applicants respectfully submit that this is improper. The following is quoted from the MPEP

> **2111.04 "Adapted to," "Adapted for," "Wherein," and "Whereby" Clauses [R-3]**
>
> Claim scope is not limited by claim language that suggests or makes optional but does not require steps to be performed, or by claim language that does not limit a claim to a particular structure. However, examples of claim language, although not exhaustive, that may raise a question as to the limiting effect of the language in a claim are:
>
> (A) "adapted to" or "adapted for" clauses;
>
> (B) "wherein" clauses; and
>
> (C) "whereby" clauses.
>
> The determination of whether each of these clauses is a limitation in a claim depends on the specific facts of the case. In *Hoffer v. Microsoft Corp.*, 405 F.3d 1326, 1329, 74 USPQ2d 1481, 1483 (Fed. Cir. 2005), the court held that when a "'whereby' clause states a condition that is material to patentability, it cannot be ignored in order to change the substance of the invention." *Id.* However, the court noted (quoting *Minton v. Nat'l Ass'n of Securities Dealers, Inc.*, 336 F.3d 1373, 1381, 67 USPQ2d 1614, 1620 (Fed. Cir. 2003)) that a "'whereby clause in a method claim is not given weight when it simply expresses the intended result of a process step positively recited.'" *Id.*<

As this section clarifies, "adapted to" clauses are not to be universally ignored. They must be considered in context and in light of the facts. Here this is a structural limitation material to

patentability, not merely an intended result. Therefore the language cannot be ignored, per MPEP 2111.04

VIII. CONCLUSION

Applicant respectfully submits that he has answered each issue raised by the Examiner and demonstrated the art rejections to be deficient -- and that the application is accordingly in condition for allowance. Such allowance is therefore respectfully requested.

Respectfully submitted,

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CLAIMS APPENDIX

1. A light source (1) comprising

- a discharge vessel (2) which is filled with a filling gas,
- an electron beam source (4) arranged in vacuum or in a region of low pressure, which source (4) generates electrons (12) and propels them through an inlet foil (8) into the discharge vessel (2),

characterized in that the inlet foil (8) comprises a diamond layer.

2. A light source as claimed in claim 1, characterized in that the diamond layer has a thickness below 100 μm.

3. A light source as claimed in claim 1, characterized in that the diamond layer has a frame (7).

4. A light source as claimed in claim 1, characterized in that the diamond layer has a metal brazing layer.

5. A light source as claimed in claim 1, characterized in that the diamond layer has an organic adhesion layer.

6. A light source as claimed in claim 1, characterized in that the electron beam source comprises a thermionic electron emitter.

7. A light source as claimed in claim 1, characterized in that the electron beam source comprises a field emitter.

8. A method of manufacturing a foil (8) for a light source (1), characterized by the following process steps:

- carbon atoms are deposited on a substrate (7) so as to form a diamond foil (8), and
- a portion of the substrate is etched away such that a remaining portion (7) of the substrate forms a frame (7) for the diamond foil (8).

9. A method of manufacturing a foil (8) for a light source (1), characterized by the following process steps:

- carbon atoms are deposited on a substrate so as to form a diamond foil (8),
- the diamond foil (8) is removed from the substrate, and
- the diamond foil (8) is brazed to a frame (7).

10. A method of manufacturing a foil (8) for a light source (1), characterized by the following process steps:

- carbon atoms are deposited on a substrate so as to form a diamond foil (8),
- the diamond foil (8) is removed from the substrate (7), and
- the diamond foil (8) is adhered to a frame (7).

11. A gas discharge lamp (1) comprising

- a discharge vessel (2) which is filled with a filling gas, which vessel is adapted to produce non-coherent visible light from at least one wall in response to received radiation produced by the gas;
- an inlet foil comprising a diamond layer;
- an electron beam source (4) arranged in vacuum or in a region of low pressure, which source (4) generates electrons (12) and propels them through the inlet foil (8) into the discharge vessel (2), causing the gas to produce the radiation.

12. A method of manufacturing a light source, comprising, not necessarily in the following order:

- providing
  - a discharge vessel (2) which is filled with a filling gas, which vessel is adapted to produce non-coherent visible light from at least one wall in response to received radiation produced by the gas
  - an electron beam source (4) arranged in vacuum or in a region of low pressure, which source (4) generates electrons (12) and propels them into the discharge vessel (2), causing the gas to produce the radiation;
- inserting an inlet foil between the source and the vessel, which inlet foil comprises a diamond layer.

13. The method of claim 12, wherein the light source is a gas discharge lamp.

14. The light source of claim 2, wherein the diamond layer has a thickness below 50μm.

15. The light source of claim 2, wherein the diamond layer has a thickness below 20μm.

16. The light source of claim 7, wherein the field emitter comprises carbon nanotubes for widening the electron beam.

17. The method of claim 8, further comprising inserting the foil between an electron source and a discharge vessel of a gas discharge lamp that emits non-coherent visible light from at least one phosphor on at least one wall of the discharge vessel.

18. The method of claim 9, further comprising inserting the foil between an electron source and a discharge vessel of a gas discharge lamp that emits non-coherent visible light from at least one phosphor on at least one wall of the discharge vessel.

19. The method of claim 10, further comprising inserting the foil between an electron source and a discharge vessel of a gas discharge lamp that emits non-coherent visible light from at least one phosphor on at least one wall of the discharge vessel.

20. The light of claim 1, wherein the electrons generate radiation in the filling gas, and at least one wall of the discharge vessel comprises a phosphor that produces non-coherent visible light in response to the radiation.

EVIDENCE APPENDIX

Copies of evidence 41.37 (c)(1)(ix)

RELATED APPEALS APPENDIX

NONE